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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,986	06/22/2006	Philip Barrowclough	59643.00688	8417
32294 7590 10/30/2008 SQUIRE, SANDERS & DEMPSEY L.L.P. 8000 TOWERS CRESCENT DRIVE 14TH FLOOR VIENNA, VA 22182-6212			EXAMINER PELLIGRINO, JEFFREY S	
			ART UNIT 2629	PAPER NUMBER
			MAIL DATE 10/30/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/583,986

Applicant(s)

BARROWCLOUGH, PHILIP

Examiner

JEFF PELLGRINO

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 37-45, 48, and 52-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nading et al (U.S Patent # 6,369,800), hereinafter referenced as Nading.

Regarding **claim 37**, Nading discloses:

a transmitter configured to generate a light signal [light source 30A, column 3, lines 55-56, and figure 2];

a receiver configured to receive the light signal [optical detector 32A, column 3, lines 53, and figure 2];

a light guide having a surface for internally reflecting the light signal from the transmitter to the receiver [light guide 20A, column 3, lines 52-54, and figure 2];

and an actuator having an actuator surface, said actuator surface having at least a portion which is movable between a first position spaced apart from a portion of said light guide surface, with a gas or fluid there between, and a second position which is in contact with the portion of the light guide surface [plunger 16A, column 3, lines 54-61, and figure 2],

wherein the portion of the actuator surface has a different refractive index than the gas or fluid, and wherein in use the relative refractive index is changed at a contacted portion of the light guide surface, thereby altering the light signal received by the receiver [plunger 16A has a light reflective material or coating 36, column 3, lines 61-66, and figure 2], however, Nading does not disclose expressly wherein the portion of the light guide surface has a higher refractive index than the portion of the actuator surface.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to make the light guide more reflective than the coating on the plunger because Applicant has not disclosed that wherein the portion of the light guide surface has a higher refractive index than the portion of the actuator surface provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well regardless of the relative reflectivity of the coating on the plunger and the light guide because the system will still detect the presence of plunger even if the plunger is not as reflective as the light guide.

Therefore, it would have been an obvious matter of design choice to modify Nading to obtain the invention as specified in claim 37.

Regarding **claim 38**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the receiver is configured to output a signal indicative of the position of the contacted portion of the light guide surface [column 3, lines 54-61, and figure 2].

Regarding **claim 39**, Nading disclose everything claimed as applied above (see claim 37), in addition, Nading discloses wherein the receiver is configured to use the received signal to control a position of an element [column 3, lines 54-61, and figure 2]. Although Nading does not explicitly teach controlling the position of an element, the examiner takes official notice that it was well known in the art at the time the invention was made to have buttons (keypads) on a cell phone that control the position of a cursor on the display of the cell phone. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the keypad using the keys as taught by Nading on a keypad for such a cell phone for the purpose of providing a simple structure to both illuminate the key and determine when a key was been pressed by a user.

Regarding **claim 40**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the second position is at a selected one of a plurality of portions on the surface of the light guide [column 3, lines 55-62, figure 2].

Regarding **claim 41**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein a plurality of transmitters is provided [keypad 12 includes at least one plunger 16 associated with a key 18, column 3, lines 32-33, and figure 1-2]. Although Nading does not explicitly teach that the keypad has multiple key and each key has a system shown in figure 2, however, the Examiner takes official notice that it would have been obvious to one of ordinary skill in the art at the time the invention was made keypads usually have multiple

keys and therefore there would be a plurality of transmitters since each key would need it's one transmitter and receiver.

Regarding **claim 42**, Nading discloses everything as applied above (see claim 41), however, Nading fails to explicitly disclose wherein the transmitters are arranged to pulse alternatively. The Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time the invention was made that when the keys are implemented in a keypad as taught by Nading, when two different keys are pressed one after another, such as when someone is typing a text message, the transmitters for each key pulse alternatively because the keys only reflect light back to the receiver when pressed. When the keys are pressed one after another, they light from the transmitter of the first key is pulsed to its respective receiver and then the transmitter of the second key is pulsed to its respective receiver, hence pulsing alternatively.

Regarding **claim 43**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein a plurality of receivers is provided [keypad 12 includes at least one plunger 16 associated with a key 18, column 3, lines 32-33, and figure 1-2]. Although Nading does not explicitly teach that the keypad has multiple key and each key has a system shown in figure 2, however, the Examiner takes official notice that it would have been obvious to one of ordinary skill in the art at the time the invention was made keypads usually have multiple keys and therefore there would be a plurality of receivers since each key would need it's one transmitter and receiver.

Regarding **claim 44**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the transmitter comprises an LED [column 5, lines 24-27].

Regarding **claim 45**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the receiver comprises a photodiode [optical detector 32A, column 3, lines 53, and figure 2].

Nading does not disclose expressly the optical detector is a photodiode.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to implement the optical detector using a photodiode because Applicant has not disclosed that using a photodiode provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with any type of optical detector because the optical detector only needs to be able to determine if light is or isn't present.

Therefore, it would have been an obvious matter of design choice to modify Nading to obtain the invention as specified in claim 45.

Regarding **claim 48**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein said surface of said actuator comprises a hemispherical surface [bottom protrusion of plunger 16A, figure 2].

Nading does not disclose expressly a hemispherical surface.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to round the edges of the protrusion on the bottom

of the plunger 16A because Applicant has not disclosed that having a hemispherical surface provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the surface shaped as a trapezoid because either type of surface allows for light to be reflected to the receiver to determine if the key has been pressed.

Therefore, it would have been an obvious matter of design choice to modify Nading to obtain the invention as specified in claim 48.

Regarding **claim 52**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein said actuator has an upper portion in the form of a stick for actuation by a user [top of plunger 16A, figure 2].

Regarding **claim 53**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein said actuator comprises an arcuate disk disposed on said surface of said actuator [top of plunger 16A, figure 2].

Regarding **claim 54**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the transmitter and the receiver are disposed in a layer on an opposite side of said light guide to said actuator [figure 2].

Regarding **claim 55**, Nading discloses everything claimed as applied above (see claim 37), in addition, Nading discloses processing device for processing the or each signal received by the or each receiver and outputting a control signal to control the position of the element

[processing device for processing the or each signal received by the or each receiver and outputting a control signal to control the position of the element column 3, lines 54-61, and figure 2]. Although Nading does not explicitly teach controlling the position of an element or using a processor, the examiner takes official notice that it was well known in the art at the time the invention was made to have buttons (keypads) on a cell phone that control the position of a cursor on the display of the cell phone. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the keypad using the keys as taught by Nading on a keypad for such a cell phone for the purpose of providing a simple structure to both illuminate the key and determine when a key was been pressed by a user. This combination would inherently teach a processor because some type of processor would be necessary to perform the specific function of moving the cursor based on the user pressing the buttons.

Regarding **claim 56**, Nading discloses everything claimed as applied above (see claim 37), although Nading does not explicitly teach a display for displaying an element, whereby in use the position of the element on the display is controlled, the examiner takes official notice that it was well known in the art at the time the invention was made to have buttons (keypads) on a cell phone that control the position of a cursor on the display of the cell phone. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the keypad using the keys as taught by Nading on a keypad for such a cell phone for the purpose of providing a simple structure to both illuminate the key and determine when a key was been pressed by a user.

Regarding **claim 57**, Nading disclose everything claimed as applied above (see claim 37), however, Nading fails to disclose "wherein said received signal is used to produce a radio signal for controlling a radio controlled device".

However, the Examiner takes official notice that it was well known to people of ordinary skill in the art at the time the invention was made that remote controls for radio control devices (i.e. RC cars) used buttons to control the radio controlled device. Therefore it would have been obvious to use the key or button taught by Nading as the buttons on one of these remotes for the purpose of providing a simple structure to both illuminate the key and determine when a key was been pressed by a user.

Regarding **claim 58**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the actuator surface is exposed at the exterior of the device [figure 2].

Regarding **claim 59**, Nading discloses everything as applied above (see claim 37), in addition, Nading discloses wherein the actuator surface is manually actuatable by a user of the device [key 18A is operated by a user, column 3, lines 58-61, and figure 2].

Regarding **claim 60**, the limitations of this claim are substantially similar to those found in independent claim 37 and is therefore rejected for in a similar manner.

Regarding **claim 61**, Nading discloses everything as applied above (see claim 60), in addition, the limitations of this claim are substantially similar to those found in claim 58 and is therefore rejected for in a similar manner.

Regarding **claim 62**, Nading discloses everything as applied above (see claim 61), in addition, the limitations of this claim are substantially similar to those found in claim 59 and is therefore rejected for in a similar manner.

Regarding **claim 63**, Nading discloses everything as applied above (see claim 61), in addition, Nading discloses wherein the actuator surface is actuable by a user via a key of the device [key 18, column 3, lines 32-33, and figure 1].

Regarding **claim 64**, Nading discloses everything as applied above (see claim 63), in addition, Nading discloses wherein the key comprises part of a keypad [keypad 12, column 3, lines 32-33, and figure 1].

Regarding **claim 65**, Nading discloses;

generating a light signal [light source 30A, column 3, lines 55-56, figure 2];

and reflecting the light signal off a surface [plunger 16a, column 3, lines 54-66, figure 2],

wherein a relative refractive index between materials on either side of the surface is changed, thereby altering the reflected light signal, the reflected light signal being received and used to control a position of an element [column 3, lines 54-66, figure 2].

Nading does not explicitly teach controlling the position of an element, the examiner takes official notice that it was well known in the art at the time the invention was made to have buttons (keypads) on a cell phone that control the position of a cursor on the display of the cell phone. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the keypad using the keys as taught by Nading on a keypad for such a cell phone for the purpose of providing a simple structure to both illuminate the key and determine when a key was been pressed by a user.

Regarding **claim 66**, the limitations of this claim are substantially similar to those found in independent claim 37 and is therefore rejected for in a similar manner.

Regarding **claim 67**, Nading discloses everything as applied above (see claim 66), in addition, the limitations of this claim are substantially similar to those found in claim 38 and is therefore rejected for in a similar manner.

Regarding **claim 68**, Nading discloses everything as applied above (see claim 66), in addition, Nading discloses wherein the actuator comprises a key or button [key 18 & 18A, column 3, lines 32-33, and figure 1 and 2].

Regarding **claim 69**, Nading discloses everything as applied above (see claim 66), in addition, Nading discloses wherein said device further comprises a key which moves said actuator in use [key 18 & 18A, column 3, lines 32-33, and figure 1 and 2].

Regarding **claim 70**, Nading discloses everything as applied above (see claim 68), in addition, Nading discloses wherein said device comprises a plurality of keys [keypad 12, column 3, lines 32-33, and figure 1]. Although Nading does not explicitly teach that the keypad has a plurality of keys, the Examiner takes official notice that it would have been well known to one of ordinary skill in the art at the time the invention was made that a keypad has multiple keys.

Regarding **claim 71**, the limitations of this claim are substantially similar to those found in independent claim 37 and is therefore rejected for in a similar manner.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nading in view of Ochiai (U.S Patent # 6,196,691), hereinafter referenced as Ochiai.

Regarding **claim 47**, Nading discloses everything claimed as applied above (see claim 37), however, Nading fails to disclose “*wherein the light guide includes an optical grating.*”

In a similar field of endeavor, Ochiai discloses wherein the light guide includes an optical grating [diffraction grating, column 2, line 66 to column 4, line 7].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nading by specifically providing “*wherein the light guide includes an optical grating*”, as taught by Ochiai, for the purpose of obtaining high, uniform brightness even with use of point light sources and reduce power consumption [Ochiai, column 4, lines 1-7].

Claims 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nading in view of Wingett (U.S. Publication # 2002/0061735), hereinafter referenced as Wingett.

Regarding **claim 49**, Nading discloses everything claimed as applied above (see claim 37), however, Nading fails to disclose “*wherein said surface of said actuator is supported by one or more side walls.*”

In a similar field of endeavor, Wingett discloses wherein said surface of said actuator is supported by one or more side walls [bridging membrane 27, paragraph 0032, and figure 5].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nading by specifically providing “*wherein said surface of said actuator is supported by one or more side walls*”, as taught by Wingett, for the purpose of resist tilting of the key [Wingett, paragraph 0032].

Regarding **claim 50**, Nading and Wingett disclose everything claimed as applied above (see claim 49), in addition, Wingett discloses wherein said one or more side walls are deformable bridging membrane 27 can be stretched, paragraph 0032, and figure 5].

Regarding **claim 51**, Nading discloses everything claimed as applied above (see claim 37), however, Nading fails to disclose “*wherein said surface of said actuator is deformable.*”

In a similar field of endeavor, Wingett discloses wherein said surface of said actuator is deformable [bridging membrane 27 can be stretched, paragraph 0032, and figure 5].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nading by specifically providing “*wherein said surface of said actuator is deformable*”, as taught by Wingett, for the purpose of resist tilting of the key [Wingett, paragraph 0032].

Claims 37 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinckley et al (U.S Patent # 6,844,871), hereinafter referenced as Hinckley.

Regarding **claim 37**, Hinckley discloses:

a transmitter configured to generate a light signal [LED 282-292, column 7, lines 46-50, and figure 9];

a receiver configured to receive the light signal [camera 294, column 7, lines 46-50, and figure 9];

a light guide having a surface for internally reflecting the light signal from the transmitter to the receiver [working surface, column 7, lines 46-50, and figure 9];

and an actuator [mouse 200] having an actuator surface [bottom of the mouse], said actuator surface having at least a portion which is movable between a first position spaced apart from a portion of said light guide surface, with a gas or fluid there between, and a second position which is in contact with the portion of the light guide surface [the LED and camera system detect when the mouse is tilted as shown in figures 11-16, in addition, as shown in figure 13 the mouse is tilted to the left such that the light coming from the LED on the right is not sensed by the camera, then in figure 16, the mouse is tilted to the right and the light from the

LED on the right side is detected, column 7, lines 46-56, column 8, lines 35-54, and figures 9, 13, and 16],

wherein the portion of the actuator surface has a different refractive index than the gas or fluid, and wherein in use the relative refractive index is changed at a contacted portion of the light guide surface, thereby altering the light signal received by the receiver [the working surface is reflective, column 7, lines 46-50, and figure 9], however, Nading does not disclose expressly wherein the portion of the light guide surface has a higher refractive index than the portion of the actuator surface.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to make the light guide more reflective than bottom of the mouse because Applicant has not disclosed that wherein the portion of the light guide surface has a higher refractive index than the portion of the actuator surface provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well regardless of the relative reflectivity of the bottom of the mouse and the light guide because the system will still detect the tilting of the mouse even if the bottom of the mouse is not as reflective as the light guide.

Therefore, it would have been an obvious matter of design choice to modify Hinckley to obtain the invention as specified in claim 37.

Regarding **claim 46**, Hinckley discloses everything as applied above (see claim 37), in addition, Hinckley discloses wherein four transmitters and a single receiver are provided in a

cross configuration having four comers and a center, each one of the transmitters being disposed at one of the comers and the receiver being disposed at the center [LEDs 282, 286, 288, 292, camera 294, figure 9].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFF PELLIGRINO whose telephone number is (571)270-3572. The examiner can normally be reached on Mon.- Fri. 7:30am-5:00pm ET (alt. Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeff Pelligrino
Examiner
Art Unit 2629

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/Amr Awad/

Supervisory Patent Examiner, Art Unit 2629